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EXTENDED PLANTING SEASONS FOR SYCAMORE AND COTTONWOOD

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SOUTHERN FOREST EXPERIMENT STATION

Cuttings of sycamore and cottonwood can be planted successfully in wet soil from October until bud break in the spring. Sycamore seedlings can be planted all year if available soil moisture exceeds evapotranspiration. Dormant seedlings survived summer planting better than did freshly lifted seedlings.

Additional keywords: *Platanus occidentalis*, *Populus deltoides*, planting time.

Because the winter planting season combines miserable working conditions with insufficient time for setting trees, planters are eager to extend its customary limits. The study described here was undertaken to determine how the month of planting influenced survival and first-year growth of sycamore seedlings and cuttings and cottonwood cuttings in the vicinity of Stoneville, Mississippi.

¹The author is stationed at the Southern Hardwoods Laboratory, which is maintained at Stoneville, Mississippi, by the Southern Forest Experiment Station, USDA Forest Service, in cooperation with the Mississippi Agricultural and Forestry Experiment Station and the Southern Hardwood Forest Research Group.

METHODS

For 4 consecutive years American sycamore (*Platanus occidentalis* L.) and eastern cottonwood (*Populus deltoides* Bartr.) were planted in randomized complete blocks. Except as indicated below, both species were treated alike.

Cuttings 20 inches long and of mixed diameter were taken from the main stem of year-old sprouts. Seedlings were pruned to a 4-inch top and a 6-inch taproot, with all lateral roots removed.

Stock for the first year's planting was prepared in the morning, stored with root or basal portion in water for 1 to 3 hours, then planted in the afternoon of the same day. In the 3 subsequent years, stock was prepared, left in water overnight, and planted the following day.

The only exception was the dormant sycamore seedlings planted during the growing season. They were lifted during late winter and kept at 33-38°F. in a dark room until the day before planting. They were then removed from cold storage, pruned, and stored in water overnight in the same manner as the freshly lifted seedlings.

All planting sites were within 20 miles of Stoneville, Mississippi (approximately 33°20' north latitude). A new location was used each year; plantings were made on Sharkey clay loam the third year and on Commerce silt loam the other 3 years.

Trees were planted in bare soil and cultivated through the first growing season.

During the first 2 years systematically selected trees were lifted at the end of each month to assess root development.

In the first year, 1967-68, planting began in October and ended in April, on the assumptions that October was actually too early and April too late. These assumptions proved false, and planting was extended further into the growing season during the next 3 years. The months tested each year are indicated in tables 1 to 4.

Table 1.—Summary of measurements in November 1968

Month of planting	Height	Diameter	Survival
	Feet	Inches	Percent

COTTONWOOD CUTTINGS

February	14.9a ¹	1.6a	95a
October	14.4a	1.6a	94a
January	13.9ab	1.5a	91a
March	13.4ab	1.4a	96a
December	12.6 bc	1.4a	85a
November	12.5 bc	1.4a	81a
April ²	11.5 c	1.6a	50 b

SYCAMORE SEEDLINGS

February	8.4a	1.2a	98a ³
October	8.0ab	1.2a	97a
January	8.0ab	1.2a	98a
March	8.0ab	1.2a	100a
November	7.6ab	1.2a	100a
December	7.3 b	1.1ab	99a
April ²	6.1 c	1.0 b	100a

¹ Within columns, values not followed by the same letter are significantly different at the 95-percent level of probability.

² Leafed out.

³ All sycamore mortality was associated with mechanical damage during cultivation.

Plots were saturated before planting in 1967-68. In addition, from mid-November until April half of each plot was flood irrigated with 1 to 2 inches of water after any calendar week with less than 1 inch of rain.

Table 2.—Summary of measurements in November 1969

Month of planting	Planting stock		
	Cottonwood cuttings	Sycamore	
		Seedlings	Cuttings
MEAN HEIGHT OF SURVIVORS (FEET)			
August	15.4a ¹	5.0a	4.8a
September	9.0 b	4.0 c	4.3ab
October	7.7 d	4.9a	3.1 f
November	8.7 bc	4.4 b	3.8 bcde
December	8.0 cd	4.5 b	3.9 bcd
January	7.7 d	4.5 b	4.0 bc
February	8.1 cd	4.8a	3.3 def
March	7.6 d	4.5 b	3.0 f
April ²	7.7 d	4.4 b	3.4 cdef
Average	8.9	4.6	3.7

SURVIVAL (PERCENTAGE)

August	1 e	18 c	17 e
September	26 d	81 b	43 d
October	67 c	100a	83ab
November	92ab	100a	86ab
December	86ab	99a	89a
January	83 b	99a	46 d
February	88ab	98a	60 cd
March	92ab	98a	80ab
April ²	95a	95a	69 bc
Average	76	88	64

¹ Within columns, values not followed by the same letter are significantly different at the 95-percent level of probability.

² Buds just opening.

Table 3.—Survival in November 1970, percentage

Month of planting	Planting stock		
	Cottonwood cuttings	Sycamore	
		Seedlings	Cuttings
August	8	21	8
September	4	70	4
October	69	100	69
November	85	92	60
December	67	94	75
January	79	100	52
February	77	94	67
March	81	94	79
April ¹	0	94	6
May	0	23	0
June	1	88	2
July	5	81	8

¹ Leafed out.

The second year, plots were not irrigated before planting. One block (one-fourth of the plots) was irrigated three times during the winter when the soil felt dry to the touch.

Table 4.—*Survival in November 1971, percentage*

Month of planting	Planting stock			
	Cuttings		Sycamore seedlings	
	Cotton- wood	Sycamore	Fresh	Dormant
March	88	88	100	100
April ¹	52	44	92	90
May	0	0	12	100
June	12	4	80	100
July	0	4	4	76
August	0	4	48	96

¹ Leafed out.

There was no irrigation in the third and fourth years.

All measurements were made after one growing season. Any plant with a green, nonwilted leaf was assumed to be alive. Diameter 4 inches above the groundline was measured to the completed tenth-inch; height of all surviving trees was measured to the completed tenth-foot. The number of trees per plot and the number of replications of plots varied from year to year. However, the individual figures in tables 1 to 4 are based on measurements of 32 to 192 trees each.

Since no significant differences in survival, height, or diameter resulted from winter irrigation, measurements of irrigated and non-irrigated trees were pooled (tables 1 and 2). Survival and size differences were tested for statistical significance for the first 2 years (tables 1 and 2); however, the pattern of survival was so clear in the last 2 years (tables 3 and 4) that statistical tests seemed superfluous.

RESULTS AND DISCUSSION

Lifting selected trees each month revealed that roots grow throughout the year in the Stoneville area.

Cuttings of both cottonwood and sycamore behaved in a similar manner (tables 1 to 4). Some rooted throughout the year, but survival was highest for those planted in wet soil from October through March. Within that period survival and growth rates were consistently good.

Fewer cuttings rooted successfully after trees leafed out in the spring, and the overall growth for spring plantings was significantly less than that of cuttings planted earlier.

Summer planting of cuttings in dry soil was virtually fruitless (tables 2 to 4). The few that survived an August or September planting grew more than those planted later (table 2), possibly because of the early start gained by root establishment in the fall or because low survival in the plots had greatly reduced intra-specific competition.

Sycamore seedlings were planted successfully throughout the year (tables 1 to 4). However, survival varied directly with soil moisture; survival was low if the soil was dry. During the growing season, survival rates were better for dormant seedlings than for freshly lifted seedlings (table 4); the difference was less marked, however, when seedlings were planted in wet soil.

RECOMMENDATIONS

Cuttings of cottonwood and sycamore can be planted in wet soil from October until bud break in the spring.

Sycamore seedlings can be planted all year if available soil moisture exceeds evapotranspiration. Summer planting is more consistently successful with dormant seedlings than with freshly lifted stock. Neither will survive inadequate soil moisture.